12

RASTER CHART DISPLAY SYSTEM
FIELD TEST

IDENTIFICATION INFORMATION

Name of Vessel: VARIOUS VESSELS TO AND FROM BALTIMORE
Type, Tons, Length: SMALL VESSELS < 1000 TONS TO 100,000 + (ARE 1000')
Company Name: ASSOCIATION OF MARYLAND PILOTS
Contact Name: [redacted]
Address: 3720 DILLON ST
BALTIMORE, MD 21224
Telephone: 410 276-1337
E-Mail:

RASTER CHART EQUIPMENT IN USE DURING TEST

Navigation Software: MARINER
Version: 2.04
Manufacturer: INFONAV
Computer: TOSHIBA 610
Monitor Size: 10"
Monitor Resolution: 400 x 600
Raster Data Brand: NOAA

OTHER EQUIPMENT IN USE DURING TEST

Indicate (Y/N) as to whether the equipment is integrated with the raster chart navigation software. Then indicate the manufacturer and model.

GPS (Y/N): YES
DGPS (Y/N): YES - STARLINK - DNAV 212
Radar (Y/N): NO
ARPA (Y/N): NO
LORAN C (Y/N): NO
Speed Log (Y/N): NO
Compass (Y/N): NO
Other (Y/N): NO

OPERATOR (repeat on back if other operator's experience is combined in test report.)

Operator's Name [redacted]
Operator's Rank PILOT
RCDS Experience 4
Years Experience as

- helmsman
- navigation/chart work
- officer of the watch 5 - CHIEF MATE
- Captain/Master of a vessel
- pilot 28 YEARS
- other (specify)

TEST AREA

Describe the main routes or general geographic area where the RCDS was being used and evaluated:

STATE LICENSED PILOT ON WATERS OF CHESAPEAKE BAY, C&D CANAL & POTOMAC RIVER.
250 MILES OF PILOTAGE

NAVIGATION ENVIRONMENT

Estimate as a percentage of the total experience being reflected in this test report, the amount of time the RCDS was being used in the following situations.

Open Water Passage	0	Heavy Traffic	5
Coastal Transit	0	Medium Traffic	45
Harbor & Approach	50	Light or No Traffic	50
Channels/Constricted	50	total	100%
Docking	5		
Other (specify)	0	Day Navigation	40
total	100%	Night Navigation	60
		total	100%

Excellent Visibility	40	Quiet Seas	25
Fair Visibility	30	Light Seas	70
Poor Visibility	20	Moderate Seas	5
No Visibility	10	Heavy Seas	0
total	100%	total	100%

Approximate Total Days of Navigation Being Summarized in This Test Report: 500
Over How Long a Period? 4 YRS
(example answer: Approx. 8 months over 1 year with the rest being in-port periods.)

EVALUATION SCALE (use for all questions)

DESCRIPTORS & SCORE					
does not apply	much worse than paper chart	somewhat worse	comparable to paper chart	somewhat better	superior to paper chart
0	1	2	3	4	5
cannot comment	significant problem	minor problem	no problem	minor advantage	significant advantage
0	1	2	3	4	5
did not observe	hard to use	moderately difficult use	adequate ease of use	moderately easy to use	easy to use
0	1	2	3	4	5
did not use	inadequate	marginal	acceptable	good	excellent
0	1	2	3	4	5

EVALUATION SCALE (use for all questions)

1. RCDS AS A VOYAGE PLANNING TOOL

If using an RCDS for voyage planning is about the same as using a paper chart, then score the item in the middle of the range at "3".

Ref #	Scores (1-5 or 0)	Questions (compared to paper chart performance where appropriate)
		How would you evaluate doing the following navigation functions with a raster chart compared to doing the comparable functions on a paper chart?
1.1	5	- entering routes, the adequacy of the number that could be entered?
1.2	5	- entering waypoints and if an adequate number were allowed?
1.3	5	- adding waypoints to a route after entering or reloading it?
1.4	5	- deleting waypoints from a route?
1.5	5	- changing the position of a waypoint?
1.6	5	- changing the order of waypoints in a route?
1.7	5	- entering an adequate number of alternative routes?
1.8	5	- distinguishing alternate routes from the principal one?
1.9	5	- displaying routes over other charts?
1.10	5	- reloading previously planned routes for further planning?
1.11	5	- dropping or inserting waypoints in real-time as you went?
1.12	5	- loading load tracks actually sailed for use in planning?
1.13	4	- specifying a cross-track error to trigger an automatic alarm?
1.14	4	- entering and annotating marks (operator-entered points)?
1.15	5	- editing and/or deleting marks?
1.16	3	- entering points, lines or areas which would activate an alarm such as guard zones, boundaries, range circles, etc.?
1.17	4	- entering notes that you wanted to enter?
1.18	4	- preparing a printed a voyage plan, a get home chartlet, GPS waypoints?

		Remember, you are to evaluate doing the following navigation functions using a raster chart compared to doing the comparable functions on a paper chart.
1.19	5	- calculate the distance of your planned trip?
1.20	5	- calculate bearing and distance to waypoints?
1.21	5	- estimate transit time(s)?
1.22	5	- recalculate time along track if you moved waypoints?
1.23	5	- readily display all the charts you needed?
1.24	5	- move around the chart (pan and zoom) while planning?
1.25	5	- display previously entered data over any chart you wanted?
1.26	5	- make the planning assessments and judgements that you would make with a paper chart?
1.27	5	How was the planning workload compared to a paper chart?
		Score the following questions without comparing to a paper chart.
1.28	4	How was the legibility of the chart image during your planning session?
1.29	4	How was the impact on planning of seeing only a portion of a chart on the screen at one time?
1.30	5	How was the impact of chart notes not always being visible?
1.31	—	How was the impact of some charts being on different map projections?
1.32	5	How would you compare planning using a raster chart system with planning using manual means and a paper chart?
1.33	NO	Were there any fundamental limitations to planning using raster charts that were not just a limit of your software? What were they?

2. RCDS FOR VOYAGE MONITORING

If using an RCDS for **voyage monitoring** is about the same as a paper chart, then score the item in the middle of the range at "3".

Ref #	Scores (1-5 or 0)	Questions (compared to paper chart performance where appropriate)
		How would you evaluate doing the following navigation functions using a raster chart compared to doing the comparable functions on a paper chart?
2.1	5	- displaying clearly all chart and voyage monitoring information?
2.2	4	- add or remove mariner-added information?
2.3	5	- display, hide or query mariner-added information?

		Remember, you are to evaluate doing the following navigation functions using a raster chart compared to doing the comparable functions on a paper chart.
2.4	5	- determine if a larger scale chart covers the area you are navigating?
2.5	4	- distinguish the ship's track and mariner's notes on the image?
2.6	5	- showing your position accurately on the chart in real-time?
2.7	3	- performing dead reckoning if your positioning system failed?
2.8	5	- displaying a planned route?
2.9	4	- displaying an alternate route in addition to the selected one?
2.10	4	- distinguishing the alternative route from the selected one?
2.11	4	- modifying the selected route?
2.12	5	- find and display any chart easily during voyage monitoring?
2.13	5	- move around the chart (pan and zoom) to monitor your voyage?
2.14	5	- look-ahead on the route during route monitoring?
2.15	4	- achieve an adequate overview of the voyage and route?
2.16	5	- transfer information you entered other charts?
2.17	3	- view chart notes which were located off-screen?
2.18	4	- create event marks at any time and annotate them?
2.19	5	- estimating of arrival time compared to a paper chart?
2.20	5	- display the coordinates of any point on demand?
2.21	5	- enter coordinates and then display that position on demand?
2.22	5	- determine your lat./long. at any time?
2.23	5	- dynamically measure range and bearing to charted objects?
2.24	5	- monitor voyage parameters (speed over ground, course over ground, speed made good, time to go,...)?
2.25		- switch from chart to chart manually in a convenient manner?
		Score the following questions without comparing to a paper chart.
2.26	4	The adequacy of the screen size?
2.27	4	Screen "clutter" compared to a paper chart during voyage monitoring?
2.28	1	The night colors for comfortable and legible viewing?
2.29	5	Did the ship and route automatically appear whenever the display covered that area?
2.30	5	Did the chart automatically pan as the ship reached an appropriate distance from the edge of the screen?
2.31	5	View an area of the chart that did not contain the ship and have route monitoring/positioning continue in the background?
2.32	5	By a single action, show chart scale, datum, and depth and height units?
2.33	5	Determine range and bearing to items that were off-screen?
2.34	5	Restore the ship-centered display with a single action?
2.35	0	Did waypoint arrival alarms work as you wished?
2.36	0	Did boundary crossing alarms work as you wished?
2.37	0	Were there frequent false alarms?
2.38	?	Did an alarm sound when you exceeded the cross track error limit?

		Remember, you are scoring the following questions without comparison to a paper chart.
2.39	0	Did an alarm sound if the ship, within a mariner-specified time or distance, was to reach a critical point on the planned route?
2.40	5	Did your system give an indication if positioning system input was lost?
2.41	NO	If 2 positioning systems were used simultaneously, did the system identify discrepancies between the two?
2.42	5	Was route monitoring carried out in a simple and reliable manner?
2.43	5	In restricted waterways, how was the RCDS as a voyage monitoring tool compared to the paper chart?
2.44	5	In congested waterway situations, how was the RCDS as a voyage monitoring tool compared to the paper chart?
2.45	5	Could time-labels along the ships track be displayed easily at a range of intervals between 1 and 120 minutes?
2.46	5	Were you always able to navigate north up?
2.47	3	If course-up navigation was offered, how was it compared to using a paper chart?
2.48	5	How would you compare voyage monitoring using a raster chart system with voyage monitoring using a paper chart?
2.49	5	How was the voyage monitoring workload compared to a paper chart?
2.50	5	How would you rate using RCDS as the primary means of navigation compared to paper charts?
2.51	5	How would you evaluate the impact on the safety of navigation when using an RCDS as opposed to a paper chart?
2.52	NO	Are there circumstances where you would not use RCDS for voyage monitoring? When?
2.53	NO	Were there any fundamental limitations to voyage monitoring with raster charts that were not just a limit of your software? What were they?

3. RCDS FOR VOYAGE RECORDING

Ref #	Scores (1-5 or 0)	Questions (compared to paper chart performance where appropriate)
3.1	5	Could you record sufficient information to determine the ship's past track, time, position, heading and speed?
3.2	5	Were you able to add log entries manually?
3.3	5	Could you automatically record the official data used (RNC, edition, date and update history)?
3.4	5	Were you able to gather an adequate record of the voyage compared to using a paper chart?
3.5	5	Could you record the entire course made good with time marks at intervals not exceeding 4 hours?
3.6	5	Were you able to save at least the previous 12 hours of voyage track?

4. OTHER

Ref #	Scores (1-5 or 0)	Questions (compared to paper chart performance where appropriate)
4.1	5	Were the accuracy of all calculations independent of the characteristics of the display and consistent with the RNC accuracy?
4.2	5	Were bearings and distances measured on the display as accurate as that afforded by the resolution of the display?
4.3	5	Could you make manual updates to the chart that were distinguishable from the original chart without affecting the legibility of the chart?
4.4	0	Did the RCDS degrade the performance of any equipment that was connected to it?
4.5	5	Once learned, how user-friendly would you judge the RCDS to be?
4.6	NO	Did connection to other equipment degrade RCDS performance?
4.7	5	Did your system give adequate indication of system malfunction?
4.8	5	Were you able to execute in a convenient and timely manner all route planning, route monitoring and positioning performed on a paper chart?
4.9	5	How much would you say the RCDS reduced the navigational workload compared to using a paper chart?
4.10	5	**Summary Evaluation**: Considering all of your experience and the questions asked above, how would you score the following statement? "RCDS with adequate back-up arrangements used together with an appropriate folio of up-to-date paper charts ... may be accepted as complying with the chart carriage requirements of SOLAS."

Make any other comments you feel are relevant to the use of RCDS as the primary means of navigation on the back of this page.